

LightSPEED

FP 100

Infrared Wireless Microphone System



User Manual



CONGRATULATIONS!



Congratulations on your purchase of the FP 100 Infrared Wireless Microphone System! This simple, yet powerful technology adds the benefits of Classroom Audio to an existing amplifier and speakers. This system will seamlessly integrate into a sophisticated A/V control system. With its small footprint, the FP 100 can mount in any discrete location—whether it is an audio visual cabinet or below-ceiling tray.

The FP 100 is a compact, two-channel receiver that allows the use of up to two wireless microphones simultaneously in the classroom. A standard IR sensor provides high quality reception in rooms up to 1600 square feet. By connecting additional infrared sensors to the receiver, the coverage area can be expanded to provide optimal reception in varying room sizes and configurations.

The LT-71 LightMic™ is a two-channel, rechargeable microphone that is clipped to a lavalier cord and worn around the neck for teacher use, or it can be used as a standard handheld microphone for students to pass around when speaking.

SAFETY INSTRUCTIONS



CAUTION



RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED PERSONNEL



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be sufficient magnitude to constitute a risk of electric shock.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read Instructions—All the safety and operation instructions should be read before this LightSPEED product is operated.

2. Retain Instructions—The safety and operating instructions should be kept for future reference.

3. Heed Warning—All warnings on this LightSPEED product and in these instructions should be followed.

4. Follow Instructions—All operating and other instructions should be followed.

5. Water and Moisture—This LightSPEED product should not be used near water.

6. Heat—This LightSPEED product should be situated away from heat sources such as radiators, etc.

7. Power Sources—This LightSPEED product should be connected to a power supply only of the type described in these operation instructions or as marked on this LightSPEED product.

8. Power Cord Protection—Power supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them.

9. Object and Liquid Entry—Care should be taken so that objects do not fall onto and liquids are not spilled into the inside of this LightSPEED product.

10. Damage Requiring Service—This LightSPEED product should be serviced only by qualified service personnel. The user should not attempt to service this LightSPEED product.

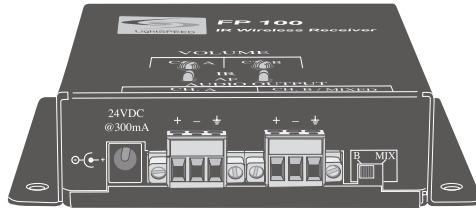
11. Prevent Electric Shock—do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

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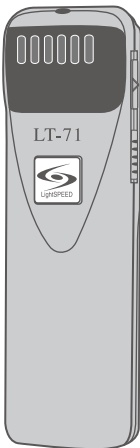
FP 100 INFRARED WIRELESS MICROPHONE SYSTEM

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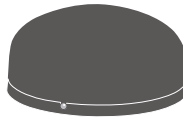
SYSTEM COMPONENTS



FP 100 Infrared Wireless Microphone System

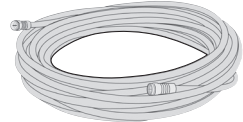


LT-71 LightMic™ Transmitter

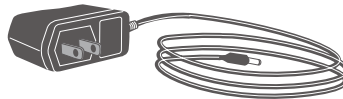


SR-70F Infrared Sensor

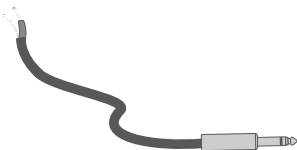
Sensor Cable



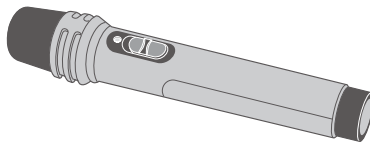
Power Supply



Charger



Audio Patch Cable



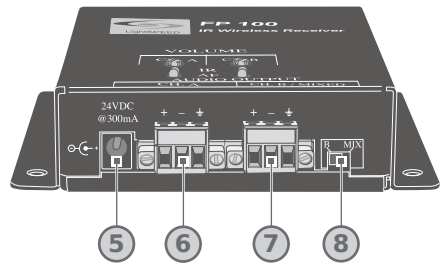
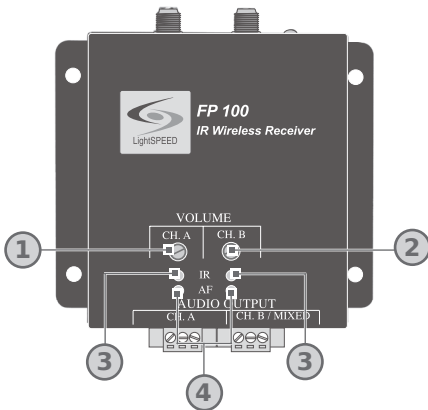
Optional HM-70 Handheld Microphone



Helpful Hint

Keep ALL packaging materials. If the system must be returned, using the original packing material will be quick, convenient and prevent damage.

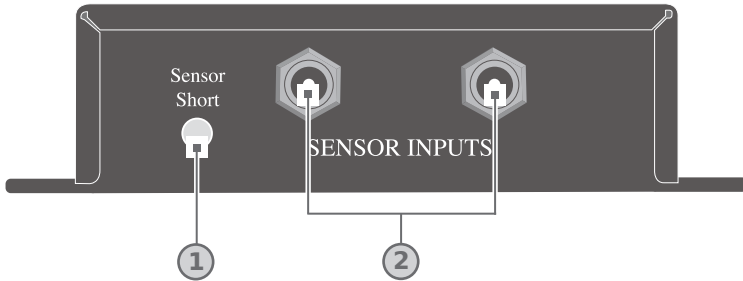
CONTROLS AND CONNECTIONS



Front and Top Panel Controls

- 1. CH. A VOLUME:** sets the nominal volume level of the teacher microphone (transmitter switched to CH A). Rotating the adjustment knob clockwise increases the output level.
- 2. CH. B VOLUME:** sets the nominal volume level of the optional second microphone (transmitter switched to CH B). Rotating the adjustment knob clockwise increases the output level.
- 3. IR INDICATORS (IR):** These lights will glow red when the corresponding transmitter is turned on and being received. This light confirms the FP 100 is receiving a steady infrared signal.
- 4. AF INDICATORS (IR):** These lights flash green when audio (voice) from the microphone is detected.
- 5. DC POWER INPUT:** Plug the 24V power supply into this jack.
- 6. CH. A AUDIO OUTPUT:** This balanced audio output can be connected to a microphone or line input on a mixer/amplifier to amplify the audio signal from the CH. A transmitter.
- 7. CH. B / MIXED AUDIO OUTPUT:** This balanced audio output sends the audio from the microphone set to CH. B. Both CH. A and CH. B transmitters (depending on the position of the B/MIX switch) are output to a microphone or line input on a mixer/amplifier.
- 8. B/MIX SWITCH:** This switch determines the audio source that is output through the CH.B/ MIXED Audio Output jack. When the switch is set to 'MIX' (default), both the CH. A and CH. B signal are output through this jack.

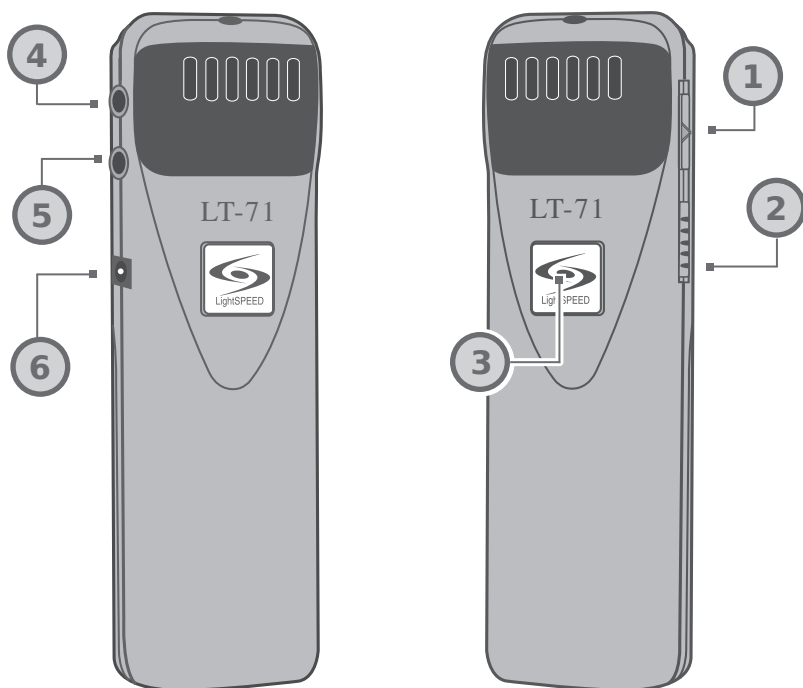
REAR PANEL CONTROLS



1. SENSOR SHORT: This LED glows when there is a short in one of the sensor cables.

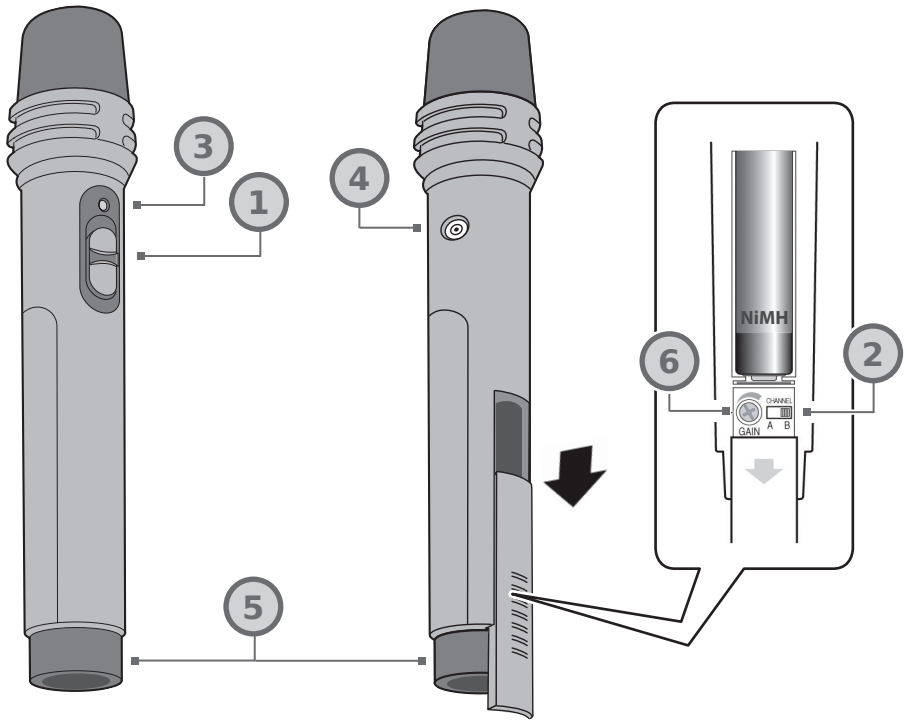
2. SENSOR INPUT: The IR sensor cable connects to the sensor input jacks. Connect additional sensors to the FP 100 to cover large or odd-shaped rooms.

LIGHTMIC CONTROLS AND CONNECTIONS



- 1. ON/OFF/MUTE Switch:** This switch, located on the side of the LightMic, turns the unit on or off/mute.
- 2. Channel Select Switch (CH A/B):** This switch allows for selection between Channel A or B. If you are using a single microphone/transmitter for your system, we recommend using Channel A.
- 3. Power/Charge LED Indicator:** The light glows blue when the LightMic is powered ON, red when plugged into the charging cable.
- 4. External Microphone Input (MIC):** Use the 3.5 mm MIC jack for the optional TK-250 headset microphone (part# MC-TK250LTM).
- 5. Auxiliary (AUX):** Plug a laptop, MP3 player or other audio source into this jack to wirelessly transmit the audio signal to be played through the FP 100.
- 6. Charger Input (CHARGER):** Plug the charging cable from the FP 100 into this jack for daily charging. The LED on the front will glow red to indicate charging.

OPTIONAL HANDHELD CONTROLS AND CONNECTIONS



1. ON/OFF/MUTE Switch: This switch, located on the side of the LightMic, turns the unit ON or OFF/MUTE.

2. Channel Select Switch (CH A/B): Located in the battery compartment, the switch is set to Channel B at the factory.

3. Power/Charge LED Indicator: The light glows red when the LightMic is powered ON.

4. Charger Input (CHARGER): Plug the charger into this jack for daily charging. The LED on the front will glow red to indicate charging.

5. Infrared Emitters: Avoid covering the emitters as you grip the HM-70 or this could interrupt signal transmission from the microphone to the receiver.

6. Volume Gain Switch: Located in the battery compartment, microphone volume can be increased by gently turning the screw. Optimum volume level is pre-set at the factory and no adjustment should be necessary.

SYSTEM INSTALLATION

Unpacking Your System

Ensure that you have received all of the components of your system.

- **FP 100 Receiver and power supply**
- **LT-71 LightMic™ Transmitter**
- **SR-70F Infrared Sensor and cable**
- **Transmitter Wall Charger**
- **Audio Patch Cable**

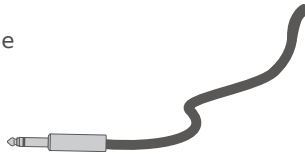
Location of the Receiver

Place the FP 100 on a flat surface like a cabinet, shelf, or tray.

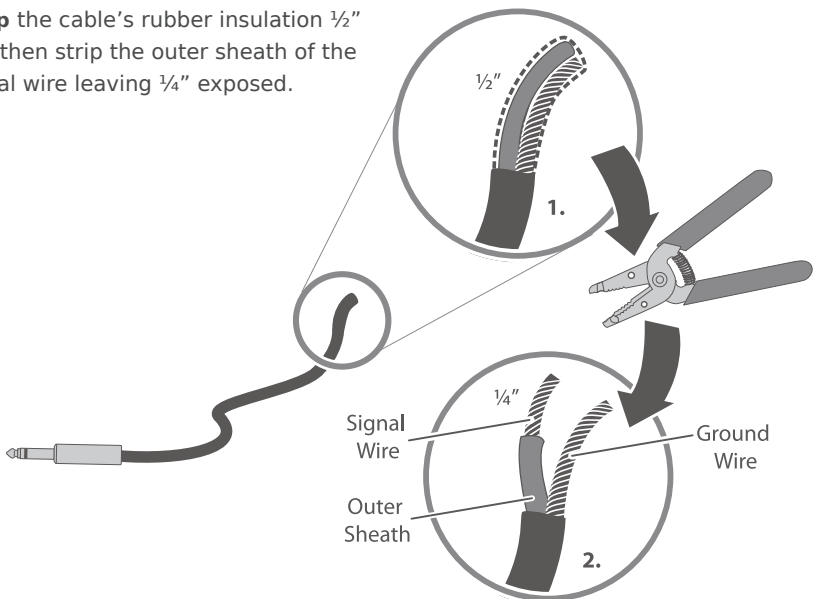
- **Select** a location that is close to a standard wall electrical outlet.
- **Sensor Cable** will be routed back to the receiver, so select a location that is free from obstructions that may make routing wire difficult. (Example: under a whiteboard or bulletin board.)

FP 100 Audio Connection

1. **Locate** the audio patch cable

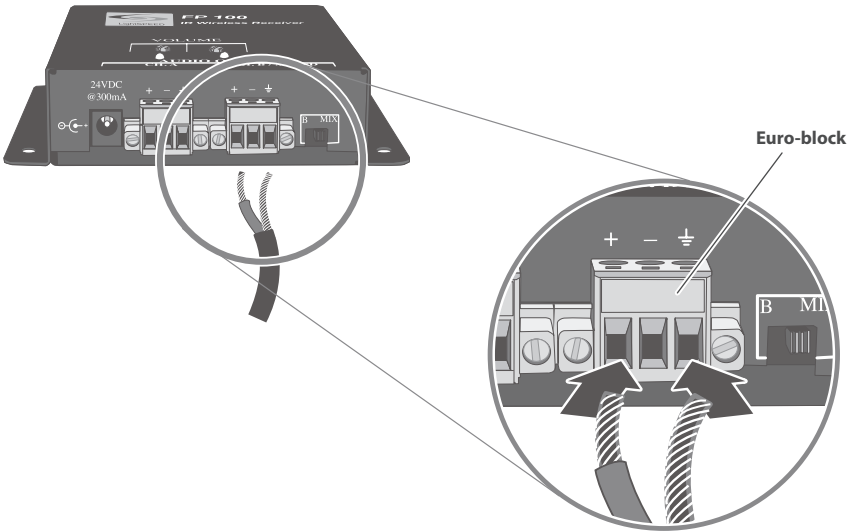


2. **Strip** the cable's rubber insulation $\frac{1}{2}$ " and then strip the outer sheath of the signal wire leaving $\frac{1}{4}$ " exposed.

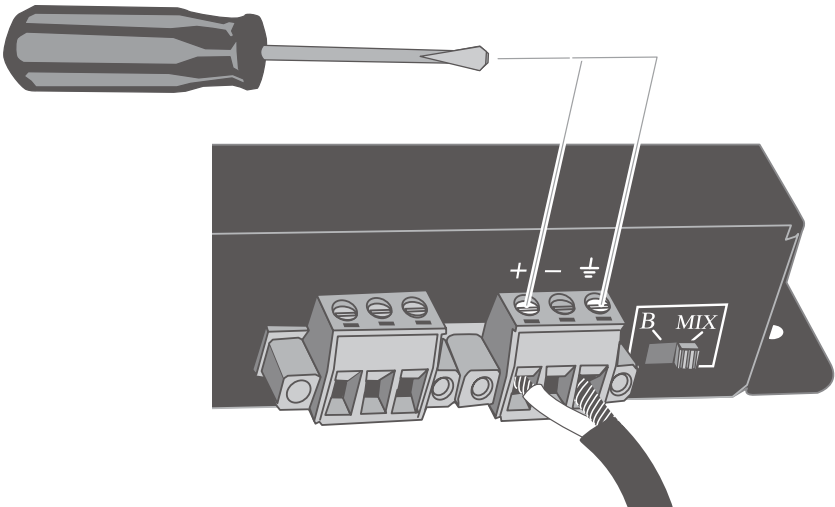


SYSTEM INSTALLATION (cont'd)

- 3. Insert** the stripped wires into the marked openings, left and right, in the Euro-block.

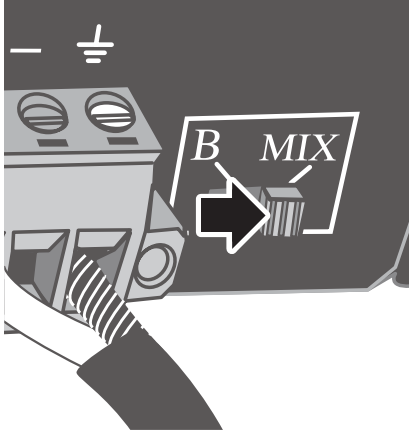


- 4. Secure** the inserted wires by tightening the retaining screws.

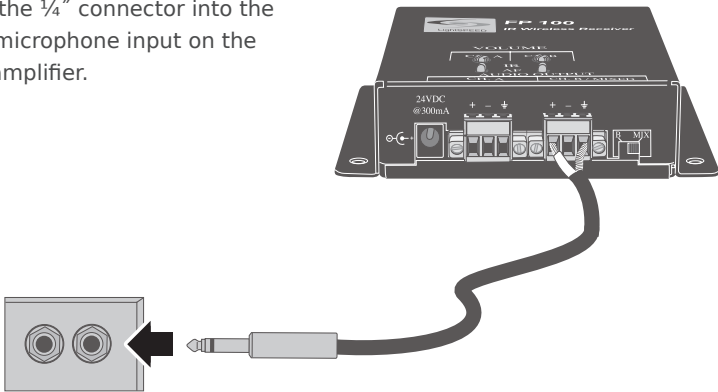


SYSTEM INSTALLATION (cont'd)

4. **Ensure** the B/MIX switch is pushed to the right to select the MIXED output.



5. **Connect** the 1/4" connector into the audio or microphone input on the existing amplifier.



FP 100 Mixed Audio Connection (Not Recommended)

This method allows for individual control of each microphone channel from the amplifier being used.

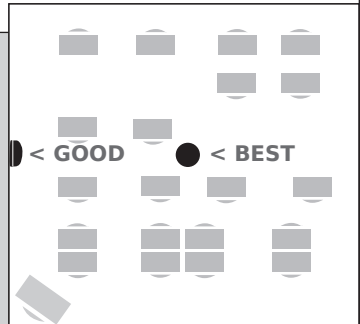
- Obtain** a second balanced audio cable.
- Strip** the wire to reveal the positive, negative, and grounded conductors.
- Fasten** the wire to the available CH A euro-block connector using a small screw driver (observe the proper polarity).

IR SENSOR INSTALLATION

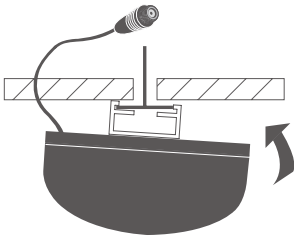
Sensor Placement in the Classroom

Sensor location is very important for optimum performance of the FP 100 IR Wireless Microphone System.

- **BEST:** On the ceiling at or near the middle of the classroom.
- **GOOD:** High and centered on the long wall.
- **AVOID:** Locations in corners, on walls at heights lower than 7 feet, or in places where the signal could be obstructed.

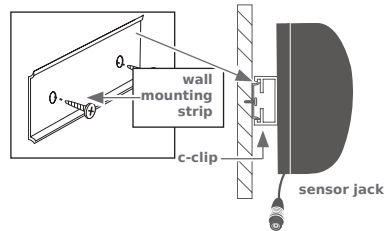


Suspended Ceiling Mount



1. **Lift** the ceiling tile nearest the grid rail in your desired sensor location. Guide one side of the C-clip over one edge of the grid rail. Providing firm support to the back of the grid rail with one hand (to prevent bending), firmly and carefully snap the second side of the C-clip over the edge of the rail.
2. **Uncoil** sensor wire. Connect one end of the sensor cable to the plug on the sensor. Loosely secure wire overhead and route it back to the FP 100.
3. **Connect** the other end of the sensor cable into one of the sensor inputs on the back of the FP 100.

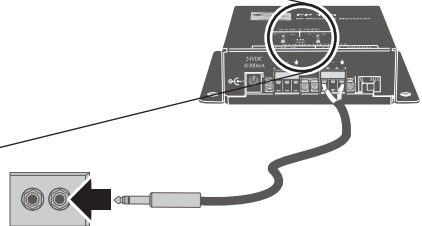
Wall/Solid Ceiling Mount



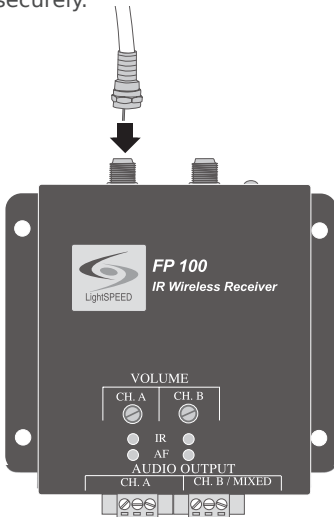
1. **Screw** the plastic mounting strip to a place high on the wall or in the middle of the solid ceiling. Mount the strip horizontally as shown above.
2. **Firmly** snap the C-clip on the back of the IR sensor onto the plastic mounting strip with the sensor hanging down (if a wall mount) or toward the receiver location (if ceiling mount).
3. **Uncoil** the sensor wire. Screw one end of the sensor cable to the plug on the sensor. Route the wire back to the FP 100, securing it along the way.
4. **Connect** the other end of the sensor cable to one of the sensor inputs on the FP 100.

FINALIZING RECEIVER CONNECTIONS

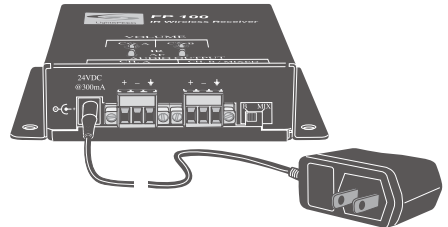
- 1. Ensure** all top panel volume controls are turned fully counterclockwise.
- 2. Ensure** audio output connection(s) are securely connected into the FP 100 and the mixer/amplifier. Make sure the CH.B/MIX switch is in the appropriate setting based on your output method (see pg. 11 for more info).



- 3. Ensure** sensor cable is attached securely.



- 4. Ensure** DC barrel end of the power supply is connected to the DC input on the FP 100.



- 5. Ensure** AC adaptor end of the power supply is connected to a standard 110 VAC electrical wall outlet.

FINAL CHECK

- 1. Ensure** all cables are appropriately routed out of walking paths and work areas to prevent safety hazards to individuals in the room.
- 2. The receiver** packing material should be kept for warranty shipping purposes. Dispose of remaining system-packing material in the appropriate refuse containers.

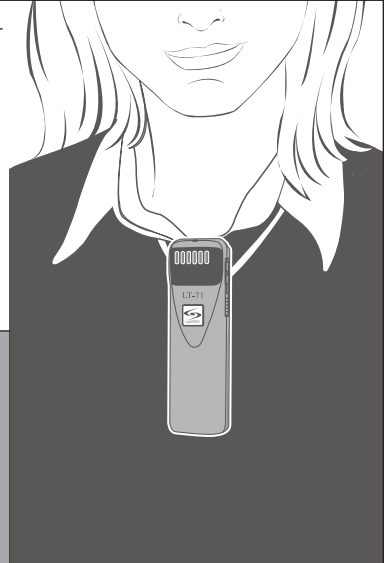
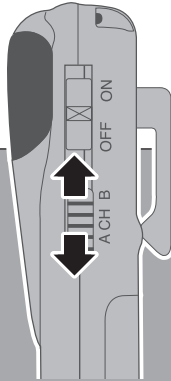
***Leave microphones charging so they are ready for use.
Microphones will need to be charged on a daily basis.***

INITIAL SET-UP

1. **Slip** the LT-71 LightMic with lanyard around your neck and position the top of the microphone just below your collarbone.

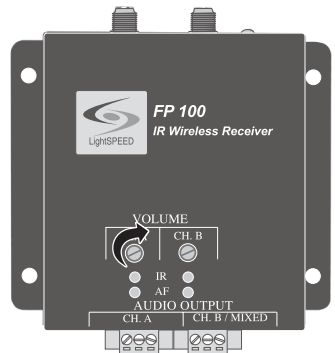
Positioning of the LightMic is critical for proper volume adjustment.

2. **Turn** on the LightMic and set the operating channel to "A." This microphone will be designated as the "Teacher Mic."

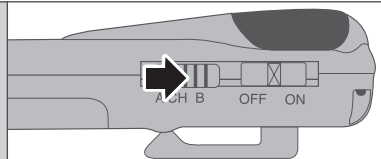


3. **Set** the volume on the mixer/amplifier at a normal level. This will be the primary control the teacher will use to turn the microphone volume(s) up and down.
4. **While** speaking in a normal voice, increase the A VOLUME level until your own voice is barely audible.

Remember: this equipment is designed to supplement and distribute the teacher's voice so he or she is able to speak at a normal, conversational tone. Having the volume set too high will result in feedback and listener fatigue.

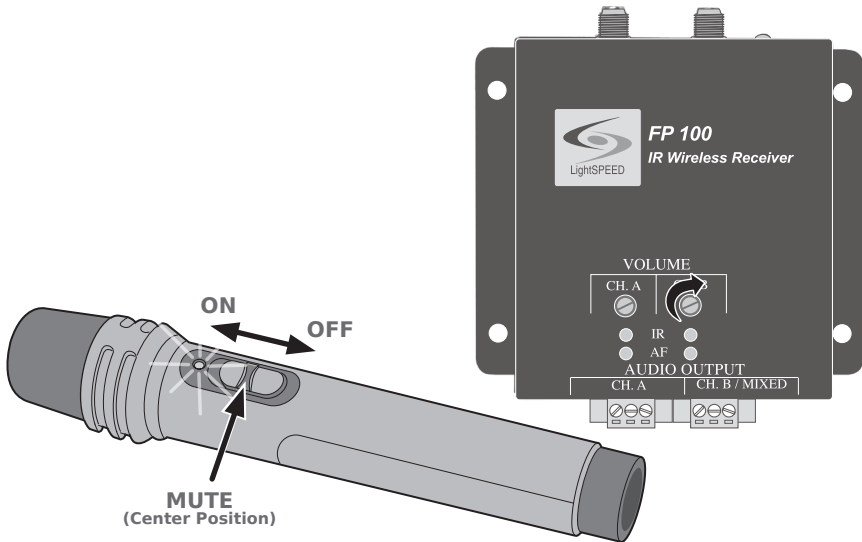


5. **If** a second student pass-around microphone was purchased, set the volume level for that transmitter as indicated above, using the B VOLUME control.



6. **Once** the normal level is set on the FP 100, the user will now use the mixer/amplifier volume control to adjust the microphone up or down during normal classroom operation.

INITIAL SET-UP: OPTIONAL HM-70 HANDHELD MIC



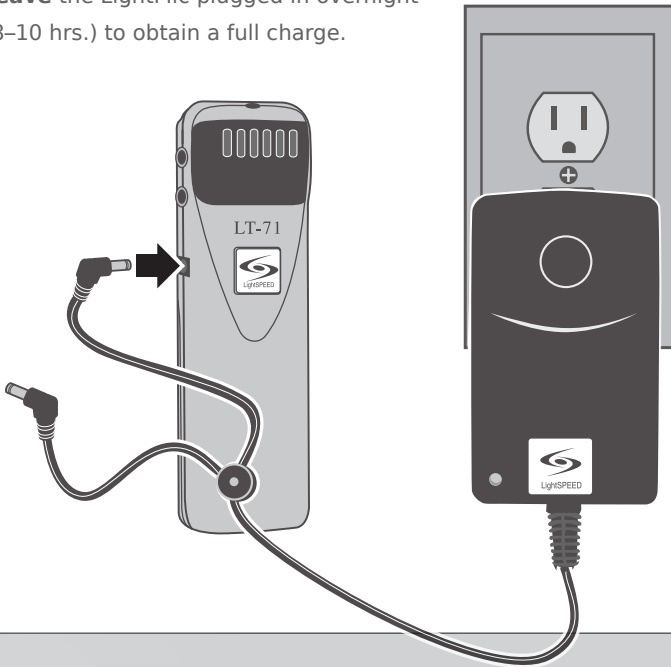
- 1. Slide** the power switch on the side of the HM-70 all the way up. The power indicator LED will glow red and stay on.
- 2. The center** position of the power switch is MUTE. When in this mode, the HM-70 is transmitting a signal, but no audio can be heard through the system. This is useful if you wish to temporarily turn audio off during a private conversation.

- 3. Grip** the barrel of the HM-70 in the center section just below the power switch. Avoid gripping the HM-70 around the bottom, covering the infrared emitters circling the base. This could interrupt signal transmission from the microphone to the receiver.
- 4. Speak** directly into the microphone at a normal level. Slowly increase the B VOLUME until you can just hear your voice.
- 5. Slide** the switch to the OFF position to turn off the HM-70. (Make sure the power indicator light is off.)

The Channel A/B switch is located inside the battery compartment. The switch is set to Channel B at the factory.

CHARGING THE LIGHTMIC

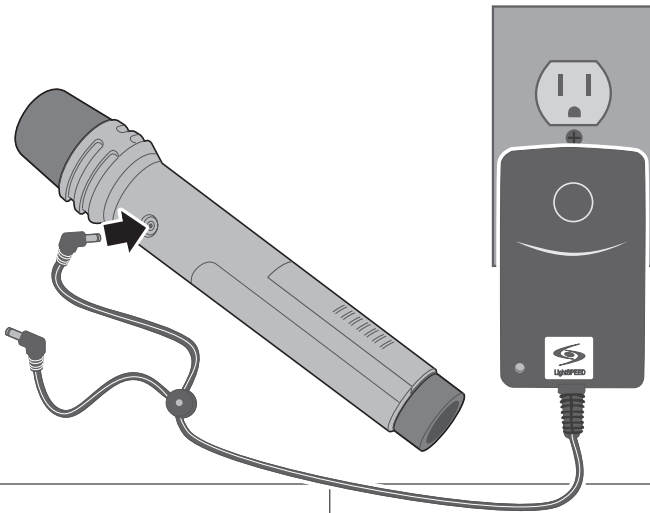
1. **Ensure** that the LightMic is turned OFF.
2. **Make** sure the wall charger is plugged into a wall outlet. Connect one of the charging plugs into the jack labeled CHARGER on the side of the LT-71.
The LT-71's rechargeable batteries are factory installed. The LED on the front of the LightMic will glow red when charging.
3. **Leave** the LightMic plugged in overnight (8–10 hrs.) to obtain a full charge.



Helpful Hint

Do not attempt to charge alkaline batteries. They can overheat and expand, creating a significant hazard and damaging the LightMic. (This is not covered by the warranty.)

CHARGING THE HM-70 HANDHELD MIC



- 1. Ensure** the HM-70 handheld microphone is turned OFF (ON/OFF switch on the side of the unit).
- 2. Make** sure the wall charger is plugged into an electrical outlet. Connect one of the charging plugs into the jack labeled CHARGER on the side of the HM-70. The HM-70's rechargeable batteries are factory installed.

- 3. The power** indicator light next to the power switch glows green when the cable is connected and charging correctly. The light goes out when fully charged. Batteries will charge in 8 to 12 hours. A fully charged battery will run for up to 8 hours of continuous operation.



Helpful Hint

All LightSPEED microphone transmitters can remain charging for up to 10 days. Overcharging will not create a hazard, but will shorten battery life.

TROUBLESHOOTING GUIDE

Note: Most problems are directly related to low battery power. Please run through the “Battery Check” items first. For remaining troubleshooting, use known good, fully-charged batteries.

Battery Check

- **Confirm** batteries are charged each night.
- **Make** sure the LT-71 is turned off while charging so that it will attain a full charge. Full charge will last eight hours.
- **Make** sure the charge cord is connected to the cradle charger.
- **Inspect** the battery contacts. Clean and adjust if necessary.

Hearing Static

- **Ensure** sensor is in optimum location (refer to sensor placement in manual). A single sensor will cover a 1600 sq. ft. enclosed classroom.
- **Ensure** that no other LT71/HM70 is operating on the same channel.
- **If** an external microphone is in use, try another LightMic that is known to be working (if available) to isolate the problem. If static persists with “known good” microphone, the LT-71 input jack has damage and will need service.

Low Volume or Feedback

- **Ensure** microphone is positioned appropriately, just below the collar bone. If a headset microphone is in use, the end of the mic boom should be positioned at the corner of the mouth.
- **Check** volume level on the amplifier/mixer (or wall-mounted controller). If the volume is set too high, feedback WILL occur—adjust accordingly.

- **Check** volume levels on the FP 100. The screwdriver adjust controls should be set at a normal level so that volume is appropriate for the classroom when the corresponding mixer/amplifier volume level is at mid-range. Adjust the levels up or down accordingly.

No Sound

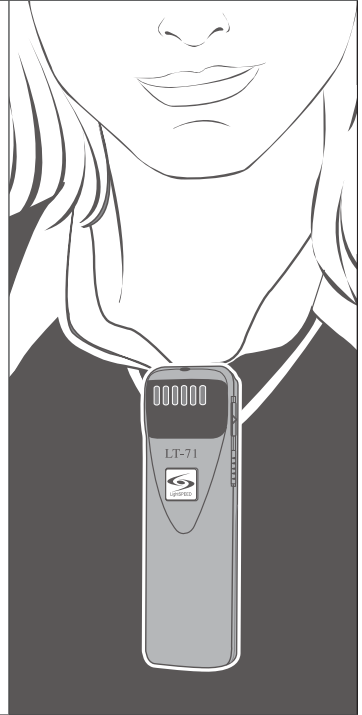
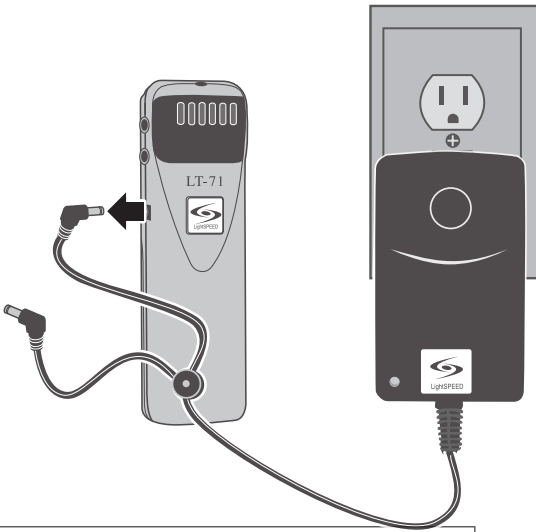
- **Confirm** the transmitter is on as indicated by a Blue LED on the LightMic or a Red LED on the HM-70 Handheld mic.
- **Confirm** signal is being received at the FP 100. The IR signal light will be lit (red) indicating a signal is being received.
- **Confirm** microphone is functioning. Next to the IR signal light is the AF signal light. This light will flicker (green) as audio is picked up by the microphone indicating activity.
- **Ensure** the IR sensor is receiving power as indicated by a red LED on one side of the unit—this should be easily visible from the ground.
- **If** no indicator lights are present on the FP 100, ensure it is receiving power. Unplug the DC power jack and re-connect. If the receiver is receiving power, the IR and AF lights will flash on when reconnected to a power source.
- **Ensure** the separate mixer/amplifier is operating properly as a stand-alone system.

If you review these instructions and still have questions, write down the serial number and model number of your system and call LightSPEED Technical Services at 800.732.8999, 5 a.m. – 5 p.m. PST.

DAILY USE INSTRUCTIONS

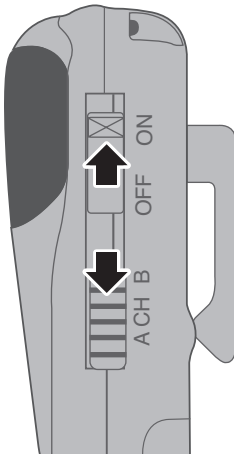
POSITION THE LIGHTMIC

Unplug the LightMic from the charger and place it around your neck. Adjust the neck strap so the top of the microphone rests just below your collarbone.



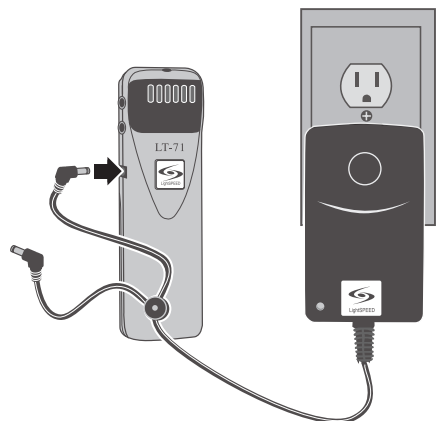
TURN ON THE LIGHTMIC

Turn the microphone ON using the ON/OFF switch on the side of the LightMic and speak normally. Set the channel switch to A.



CHARGE BATTERIES

Plug the LightMic into the Wall Charger to recharge at the end of the day.



TIPS ON CLASSROOM AUDIO

1

Speak in a natural voice. A normal conversational speech level will provide an adequate signal. It is not necessary to increase the intensity of your voice—the audio system provides adequate amplification (approximately 5 – 10 dB) above ambient room noises.

2

Avoid wearing jewelry that may rub or bump against the microphone.

3

Turn the LightMic off during private conversations with a student, parent, or other classroom visitor. You can also cover the LED lens on top of the LightMic to block the signal.

4

Recharge batteries each night. When recharged nightly, operating time (actual usage) for the transmitters will last through a typical school day.

Five-year Limited Warranty

LightSPEED Classroom Audio Systems are guaranteed against malfunction due to defects in materials and workmanship for a period of FIVE (5) YEARS, beginning at the date of the purchase invoice. If such malfunction occurs, the product will be repaired or replaced (at LightSPEED's option) without charge during the warranty period.

1. Warranty on infrared microphones is FIVE (5) YEARS.
2. Warranty on LightSPEED NH1 AA rechargeable batteries, all external cables and wires provided by LightSPEED is one (1) year.
3. Prepaid shipping labels are provided by LightSPEED factory or an authorized warranty service center for warranty repairs.
4. Warranty does not extend to finish, appearance items, or malfunctions due to abuse or operation other than specified conditions, nor does it extend to incidental or consequential damages. Repair by other than LightSPEED or its authorized service agencies will void this guarantee. Information on authorized service agencies is available from LightSPEED Technologies, Inc.

**Our Service Department (800.732.8999, 5 a.m. – 5 p.m., PST)
will handle all your repair/replacement needs.**

SYSTEM SPECIFICATIONS

OVERALL SPECIFICATIONS

Standard Carrier Frequencies (IR)	2.06/2.54 MHz
Alternative Carrier Frequencies (IR)	3.2/3.7 MHz
Frequency Stability	± 3%
Maximum Deviation	±50 Hz
Dynamic Range	> 73 dB
Signal-to-Noise Ratio	> 73 dB
Frequency Response	100 Hz – 10 kHz
Audio Output Level	0 – 1.0 V

RECEIVER SPECIFICATIONS

Receiver Type	Superheterodyne
Receiver Sensitivity	6 µV for 60 dB S/N
Image and Spurious Rejection	> 70 dB
Reception Selectivity	40 kHz
Squelching Mute Level	3.2 µV
Sensor Inputs (F-connector)	2 Input
Sensor Short Indicator	Yes
Power Supply (UL Listed)	24 V / 250 mA
Weight	
Dimensions (W x D x H)	

TRANSMITTER SPECIFICATIONS

Audio Distortion	< 1 %
Built-in Microphone	Unidirectional Electret
Battery Power (1-year warranty)	2 AA NiMH Rechargeable
Inputs	Mic Level 3.5 mm
	Line Level 3.5 mm
Dimensions (W x D x H)	1.375" x .75" x 4.625"
Weight	3.7 oz.

IR SENSOR SPECIFICATIONS

Working Range	Up to 1600 square feet
Cable	6 ft./50 ft., Plenum-rated
Mounting	Ceiling clip/Wall bracket
Dimensions	4.25" (Diam.) x 2.0" (H)
Weight	4.5 oz.

INDIVIDUAL COMPONENTS & OPTIONAL ACCESSORIES

Part Number	Description
RX-FP100	Infrared microphone receiver
LT71	LightMic rechargeable microphone/transmitter w/lavaliere cord, batteries and charging cable
BA-NH1	Rechargeable AA battery (Nickel Metal Hydride)
AC-LTCB	Lavaliere cord for LT-71
PS-24V-250	Power supply
SR70F	Infrared sensor with cable and wall or ceiling mounting bracket
BC-TXLT	Wall Charger
Optional Accessories	
HM70	Handheld microphone/transmitter w/batteries and charging cable
AC-71CC	Cradle charger
MC-TK250LTM	Noise-canceling headset microphone to be used with LT-71
SPEAKERS	Contact LightSPEED at 800.732.8999 for loudspeaker information

USER NOTES

	Record your system serial numbers and purchase information. This is helpful when ordering additional components, accessories, and/or warranty service.
Components	Serial Number
FP 100	
Microphones	
Sensors	
Speakers	
Purchase Information	
Your School/Organization	
District	
Purchase Date	
Invoice	

USER NOTES

[illegible]

AC-MN100



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